WHAT IS CLAIMED IS:

1. An array hybridization chamber for receiving at least one array to be hybridized, comprising:

a bottom surface;

at least one adjustable spacing element within the chamber to adjust a spacing between the bottom surface and the array between first and second positions in which a film of fluid can and cannot, respectively, be held by surface tension between the array and bottom surface.

2. The array hybridization chamber according to claim 1 additionally comprising a cover movable between a closed position to retain fluid in the chamber, and an open position in which the array can be inserted or removed from the chamber.

3. An array hybridization chamber comprising:

a. a bottom surface for receiving at least one array to be hybridized,

b. at least one adjustable spacing element for adjusting the spacing between said at least one array and said bottom surface,

c. a cover operatively associated with said bottom surface, wherein said cover forms a sealed enclosure with said bottom surface when in a closed position, and

d. at least one fluid port for delivering and/or removing fluid from said chamber.

4. The array hybridization chamber according to claim 3, wherein said chamber comprises at least two adjustable spacing elements.

5. The array hybridization chamber according to claim 3, wherein said cover is operatively associated with said substantially planar bottom surface by a hinge.

6. The array hybridization chamber according to claim 3, wherein said cover forms a substantially vapor tight seal with said substantially planar bottom surface when in a closed position.

7. The array hybridization chamber according to claim 3, further comprising at least one mixing element for mixing the contents of said chamber.

8. The array hybridization chamber according to claim 7, wherein said at least one mixing element is selected from the group consisting of at least one resistor, ultrasonic element, recirculation pump, at least one roller, at least one adjustable spacing element and at least one solenoid.

9. The array hybridization chamber according to claim 3, further comprising a temperature regulation system for monitoring and controlling the temperature of said chamber.

10. The array hybridization chamber according to claim 9, wherein said temperature regulation system is selected from the group consisting of a thermo-electric means, a thermo-fluidic means and a heating/cooling block.

11. The array hybridization chamber according to claim 3, wherein said substantially planar bottom surface further comprises of a plurality of micro-channels for introducing a plurality of biological samples into said chamber, such that said plurality of samples remain segregated from each other.

12. The array hybridization chamber according to claim 11, wherein said micro-channels define discrete locations on said substantially planar bottom surface.

13. The array hybridization chamber according to claim 3, further comprising at least one drying element for drying said at least one array.

14. The array hybridization chamber according to claim 13, wherein said at least one drying element comprises at least one gas jet.

15. The array hybridization chamber according to claim 3, further comprising a system for automating at least a portion of said array hybridization chamber.

16. A method for contacting a sample to an array, said method comprising:

(a) contacting the array with said sample when the array is in a first position facing a surface; and

(b) adjusting the spacing between the array and the surface.

17. A method according to claim 16, wherein the spacing is increased following the contacting.

18. A method according to claim 17 wherein a wash fluid is introduced between the array and the surface while the spacing is increased.

19. A method for contacting a sample to an array, said method comprising:

a. providing an array hybridization chamber comprising at least one adjustable spacing element,

b. placing at least one array onto said at least one adjustable spacing element,

c. adjusting said array in said chamber by moving said at least one adjustable spacing element, and

d. introducing at least one biological sample into said chamber.

20. The method according to claim 19, wherein said adjusting comprises lowering said at least one array.

21. The method according to claim 19, wherein said adjusting comprises raising said at least one array.

22. The method according to claim 19, wherein the step of introducing comprises introducing said sample between said at least one array and a substantially planar bottom surface of said array hybridization chamber.

23. The method according to claim 19, wherein the step of introducing comprises introducing said sample between said at least one array and a cover of said array hybridization chamber.

24. The method according to claim 19, further comprising mixing said at least one biological sample with said at least one array.

25. The method according to claim 19, wherein said array is adjusted to create a capillary dimension between said array and a surface of said hybridization chamber, wherein said sample is moved through said capillary dimension by capillary action.

26. The method according to claim 19, further comprising regulating the temperature of said chamber, wherein said regulation comprises monitoring and controlling said temperature.

27. The method according to claim 19, further comprising providing and maintaining a humidity level in said array hybridization chamber in the range of about 90-100%.

28. The method according to claim 19, including exchanging a plurality of fluids in said chamber, comprising the steps of:

a. introducing a first fluid into said chamber,
b. adjusting said at least one array by moving said at least one adjustable spacing element to trap a portion of said first fluid under said at least one array,
c. retaining said trapped portion of said first fluid in said chamber while removing substantially all of the un-trapped portion of said first fluid from said chamber, and
d. introducing a second fluid into said chamber.

29. The method according to claim 19, further comprising drying said at least one array by expelling a gas over or near said array.

30. The method according to claim 19, further comprising drying said at least one array by controlling fluid removal such that the meniscus entrains said fluid leaving a substantially dry array surface.

31. The method according to claim 19, wherein said method for hybridizing at least one array is substantially automated.

32. The method according to claim 19, wherein said method employs a hybridization chamber according to claim 1.

33. A system for array hybridization, said system comprising:

(a) a hybridization station, and

(b) at least one hybridization chamber according to claim 1.

34. The system according to claim 33, wherein said system further comprises an automation system for automating at least a portion of a hybridization process.